VEER KUNWAR SINGH UNIVERSITY ARA, BIHAR

ABSTRACT OF THE THESIS FOR THE DEGREE OF DOCTOR OF PHILOSOPHY IN THE FACULTY OF SCIENCE

SYNOPSIS

Topic:-

"IMPACT OF FLUORIDE TOXICITY IN HUMAN BODY ENTERED THROUGH DRINKING WATER WITH THE APPLIED ASPECT"

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SUBMITTED BY : -

NEHAL KUMAR

RESEARCH SCHOLAR
P.G DEPARTMENT OF ZOOLOGY
VEER KUNWAR SINGH UNIVERSITY, ARA

SUPERVISOR

DR. RAJESH VERMA

ASST. PROF. & HEAD
DEPT. OF ZOOLOGY
D.K COLLEGE, DUMRAON

Introduction

Fluoride is found to be a highly reactive trace element. It's main natural source of inorganic fluoride is soil and the parent rock. Like fluorosilicic acid, sodium hexafluoride is used in the fluoridation of drinking water. An appropriate intake of fluoride is beneficial in preventing dental caries. This fluoride has long been recognized to protect against tooth decay. Nearly about 1 milligram of fluoride per litre is most effective.

Many tooth paste also contain fluoride. Fluoridated water consistently raises the level of fluoride in saliva and plaque, providing continued protection of teeth (Whitford G, 1987). It protects teeth from bacteria in plaque. It also promotes new bone formation. In children under 6 years of age, fluoride becomes incorporated into the development of permanent teeth, making it difficult for acids to demineralize the teeth.

Studied the effects of fluoride ingestion both at Physiological and toxicological level (Whitford G, 1990, 1996, 1997, 1984). Beneficial effects of some vitamins and calcium on fluoride and aluminium toxicity on gastrolemius muscle and liver of male mice have been reported by N.J. Chinoy and MR Mermon, 2001. Chronic fluoride intoxication in the form of osteo-dental fluorosis was investigated in 21 village of Banswara, Dungarpur and Udaipur districts of Southern Rajasthan where the mean fluoride concentration in drinking water varied from 1.5 to 4.0ppm. In some area of Bihar, it has been found that the drinking water supply

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comes from the underground wells and is characterized by a high content of fluoride. Over the past 40-50 years, there has been an increase in the prevalence of dental fluorosis, skeletal fluorosis, gastro-intestinal manifestation are non-skeletal manifestation, among population consuming fluoridated water. The epidemiological study has been conducted in some areas of Bihar like Bhojpur, Patna, Nawada, etc.

Earlier studies of Radosavlevici I.R., Robescu D.N. on 2013 on Demineralization of water with mixed-layer ionexchangers and Noori Sepehr M., Sivasankar V., Zarrabi M., Senthil Kumar M., on 2013, Surface modification of pumice enhancing its fluoride adsorption capacity has drawn attention of scientists in the field.

Aims:

To assess the prevalence and severity of fluoride toxicity especially dental fluorosis, skeletal fluorosis, non-skeletal fluorosis manifestation and gastro-intestinal manifestation.

Objective:

The great deal of literature is available and there have been earlier reports concerning fluoride toxicity in humans. In a case study the subject numbering 2096 in habitant belonging to local families residing in different areas of Bihar were interviewed on health complaints of fluorosis. The information was recorded in a pre coded questionnaire. Every drinking water source was analysed

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for fluoride content. This led to the identification of safe and contaminated source of water. The observed results showed gastrointestinal complains along with severity of dental fluorosis, skeletal fluorosis and non-skeletal manifestation.

Parameter:

1. Development of Specific seperation technique for the treatment of drinking water leading to re-examining the use of cyclic operation in ion exchange process.
2. Establishing stable limit fronts inside the column to allow the use of two-way chromatography methods to ensure the process efficiency.
3. Numerical simulations and experimental validation at a laboratory pilot scale for the development of a technique and a set of stationary composition profiles during a cyclic operation of a chromatographic ion-exchange cyclic process.
4. Reconstituted water treatment by the cyclic process in order to selectively eliminate fluoride ion.
5. A definite correlationship between fluorosis and dental, skeletal, non-skeletal and gastro-intestinal manifestation in the area will be studied.
6. Suitable statistical analysis will be performed.

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The impact of damage in human being drinking fluoride contaminated water and after carrying out detail study over the severe action of fluoride on human body both at in dental, skeletal, non-skeletal and gastro-intestinal region, it appears that it will provide a very important data to go for further research over the intake of total dietary fluoride and also to elucidate the relative contribution of water and food stuff to fluoride intake.

Fluoride is indeed a highly reactive trace element that can be found naturally in the environment. Its main natural source is soil and the parent rock from which it can leach into groundwater and surface water sources. Fluoride compounds such as fluorosilicic acid and sodium hexafluoride are used in the process of fluoridation, which involves adding controlled amounts of fluoride to drinking water to promote dental health. An appropriate intake of fluoride has been found to be beneficial in preventing dental caries, commonly known as tooth decay. Fluoride has long been recognized for its ability to protect against tooth decay by strengthening tooth enamel and making it more resistant to acid attacks from bacteria in the mouth. It can also help remineralize the early stages of tooth decay, preventing the progression of cavities.

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